

Turbomachinery Modelling on the CHPC

Tuesday, 2 December 2025 11:00 (20 minutes)

The turbomachinery research group at Stellenbosch University consists of five to seven postgraduate (master's and PhD) students that are all doing CFD simulations of rotating machinery. The work stretches from modelling the noise and performance of large diameter cooling fans (used by Eskom), to the performance of small centrifugal compressors (used in a solar Brayton cycle) to the development of rocket engine turbines (used by the UKZN ASRI group).

The focus of the work is on supporting local technology and in all the cases, the simulations have been coupled to actual experimental evaluations. The group has been making use of the CHPC for its CFD simulation work during the past five years. The use of the CHPC enables the accurate and detailed modelling of aspects like gas turbine combustion, fan noise and blade tip leakage flow that have not previously been possible within our group. Mesh sizes of 20 million + are now common and the information gained from these simulations give researchers the ability to present their work next to researchers from much more famous entities.

The results achieved to date have been world class and the group is continuously trying to increase the complexity of its outputs and it is hoped that they will shortly be able to model 100 million + size meshes.

Presenting Author

Email

Student or Postdoc?

CHPC User

CHPC Research Programme

Workshop Duration

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